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attractive and must appeal not only to the botanical reader but to all who have a love for nature. The book abounds in catchy phrases and presents plants almost as though they were human. One result of the study of this book ought to be a more widespread recognition of plants as living things, which have rights to be respected.

Adverse criticisms upon *Minnesota Plant Life* are few, and are mainly incident to the popularization of a scientific subject. However, it is very doubtful whether a book of this character is the place in which to exploit such ideas as these: peat bog plants have xerophytic structures so as to prevent the rapid passage of water through the tissues (p. 436); the inclusion of salvinias and bladderworts under the term plankton (p. 443); extreme views on the significance of colors, in which blue as well as red is called a "warming-up" color, so that blue and red flowers are said to come from northern climes and yellow flowers from warmer climes, and that spring and fall flowers are blue or red, while summer flowers are yellow (p. 426); vernal plants are said to have come from the north, and the more leisurely plants from the south; sunflowers and their allies are the highest of the plants and may form the forests of the future (p. 471). All of these ideas are extremely fanciful, if not untrue. They may properly have a place in poetry and in the graduate classes in ecology; but the popular mind is already too full of such ideas, and it seems a pity that botanists should further encourage this kind of thinking by using it in popular works.—HENRY C. COWLES.

A popular treatise on bacteria.

IN ONE of the recent volumes of the Science series the author, Mr. George Newman, attempts "to set forth a popular scientific statement of our present knowledge of bacteria."³ The following are the principal topics discussed: the biology of bacteria; the bacteria of water, air, and soil; bacteria in milk and other foods; bacteria in fermentation; immunity and antitoxins; bacteria and disease; and disinfection. This list of subjects is an attractive one. The literary style is easy and in many ways the book seems to possess those qualifications which will assure for it a ready sale.

Books on popular science, especially if pleasing in style and manufacture, reach a vast number of readers and form a very important educational factor. Often a single book is the only treatise upon a given subject that falls into the hands of the reader. In such instances the book stands as an "authority" in the reader's mind. Because of this exalted position, which may be reached by the popular treatise with or without good reason, such books may properly be subjected to even more searching criticism than are more abstruse texts.

³NEWMAN, GEORGE: Bacteria, especially as they are related to the economy of nature, to industrial processes, and to the public health. 8vo. pp. xiv + 348; *illus.* New York and London: G. P. Putnam's Sons. 1899.

This is all the more necessary since they are intended for a class of readers who are incapable of sifting the true from the false.

In the book in hand statements similar to the following are frequent. "Many species . . . rise to the surface and lodge in the pellicle to form their seeds" (p. 19). Such a use of the word "seed" is unwarranted even in a popular treatise. On page 16 may be found this erroneous statement: "*Micrococcus agilis* is the only coccus which has flagella and active motion." On page 36 the word "attenuated" is used in such a way as to lead the unwary to believe that attenuation is synonymous with decrease in vegetative power. *Bacillus tuberculosis* is a well-known example of an organism which decreases in virulence as it increases in vegetative power in artificial culture. On page 68 is given a very questionable method for the diagnosis of cholera, viz., the direct examination of flakes of detached epithelium.

As types of loose or misleading sentences, which are very common, may be noted the following: "It will be understood that bacteria do not live in air" (p. 107), a statement that quite fails to express the meaning intended. "The gases (!) essential to plants are four, carbon dioxide, hydrogen, oxygen, and nitrogen" (p. 146); and again on p. 147, "Here then we have the necessary food of plants expressed in a sentence: *water, gases, salts, the most important and essential gas and some of the salts being combined in nitrates.*" "The reduction of a nitrite is a common property of bacteria" (p. 150). The expression "organismal process" (p. 29) is surely very unusual. "Pure cholera bacillus in suspension and typhoid bacillus in suspension were passed through these filters and not a single bacillus was detectable in the filtrate" (p. 80). While this loose diction may not lead to error, it does cost the reader much time to discover the intended meaning.

On the whole, the book is like so many other popular works, a mixture of good and bad, the accurate and the misleading. Because of the looseness and the actual error it can only be commended to the discriminating student, for whom, least of all, it was intended and who needs it least. For popular reading a better book is necessary.—F. L. STEVENS.

The forestry problem.

THE announcement that Yale University is to have a school of forestry, and the appearance of a number of publications dealing with different phases of the forestry question, show that the crusade for a better understanding of the problem is having its effect. A recent work by Mr. Bruncken on North American forests and forestry⁴ is not intended to be a guide for the professional forester, but rather to make clear to the general reader the exact condition of affairs. It is written for those who take a living interest in all

⁴BRUNCKEN, ERNEST: North American forests and forestry. Their relation to the national life of the American people. 8vo. pp. 262. New York: G. P. Putnam's Sons. 1900.